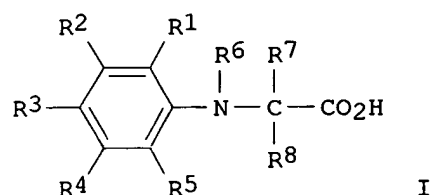


L7 ANSWER 5 OF 19 CA COPYRIGHT 2002 ACS
 AN 127:142808 CA
 TI **Photopolymerizable** composition showing high sensitivity to visible light, **photosensitive** original plate using same, and its exposure by laser
 IN Yamashita, Katsuhiko; Imahashi, Satoshi
 PA Toyobo Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 14 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM G03F007-028
 ICS C08F002-50; C08F004-62; G03F007-027; G03F007-029; G03F007-031
 CC 74-4 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
 Section cross-reference(s): 37, 38

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	JP 09160238	A2	19970620	JP 1995-316352	19951205
OS	MARPAT 127:142808				
GI					



AB The compn. contains an ethylenic unsatd. compd., a titanocene compd., a xanthene dye, and a glycine deriv. I [R1-5 = H, (substituted) acyl, haloalkyl; R6-8 = H, (substituted) alkyl, aryl, acyl; R1 .noteq. R2 .noteq. R3 .noteq. R4 .noteq. R5]. A **photosensitive** original plate having a **photosensitive** layer contg. the compn., and its exposure method to Ar ion laser, FD-YAG lasers, or He-Ne lasers are claimed. By using a combination of a titanocene initiator, a xanthene sensitizer, and a glycine deriv., **photopolymn.** sensitivity of an ethylenic unsatd. polymer to visible light is improved.

ST **photopolymerizable** compn visible light sensitive; ethylenic monomer **photopolymn** compn; titanocene initiator **photopolymn** compn visible light; metallocene initiator **photopolymn** compn visible light; xanthene sensitizer **photopolymn** compn visible light; glycine **photopolymn** compn visible light

IT **Photoimaging** materials
 Printing plates
 (**photopolymerizable** compn. showing high sensitivity to visible light for manuf. of original plate)

IT Metallocenes
 RL: CAT (Catalyst use); USES (Uses)
 (titanocene, polymn. catalysts; **photopolymerizable** compn. showing high sensitivity to visible light for manuf. of original plate)

IT 349-81-5 42288-24-4
 RL: MOA (Modifier or additive use); TEM (Technical or engineered material use); USES (Uses)
 (in **photopolymerizable** compn. showing high sensitivity to visible light for manuf. of original plate)

IT 25101-32-0P, Poly(tetraethyleneglycol dimethacrylate)
RL: IMF (Industrial manufacture); TEM (Technical or engineered material
use); PREP (Preparation); USES (Uses)
(**photopolymerizable** compn. showing high sensitivity to
visible light for manuf. of original plate)

IT 12155-89-4 125051-32-3
RL: CAT (Catalyst use); USES (Uses)
(polymn. initiator; in **photopolymerizable** compn. showing high
sensitivity to visible light for manuf. of original plate)

IT **81-88-9** 989-38-8 54854-14-7 193156-69-3
RL: MOA (Modifier or additive use); TEM (Technical or engineered material
use); USES (Uses)
(sensitizer; in **photopolymerizable** compn. showing high
sensitivity to visible light for manuf. of original plate)

L7 ANSWER 6 OF 19 CA COPYRIGHT 2002 ACS
 AN 117:201911 CA
 TI **Photopolymerizable** composition sensitive to visible light
 IN Ishii, Koichi
 PA Pilot Corp., Japan
 SO Jpn. Kokai Tokkyo Koho, 10 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM G03F007-028
 ICS G03F007-029
 CC 74-4 (Radiation Chemistry, Photochemistry, and Photographic and Other
 Reprographic Processes)
 Section cross-reference(s): 37
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 03293670	A2	19911225	JP 1990-96979	19900412
AB	In the title photopolymerizable compn. contg. an ethylenic monomer(s) and a photopolymn. initiator, the photopolymn. initiator comprises a basic dye, a tertiary aliph. amine and/or a tertiary phosphine, and a tertiary thiophosphite. The compn. shows high sensitivity not only to UV but also to visible light, and its polymn. can be expected even with a light-bulb used for illumination.				
ST	photopolymn compn visible light; initiator photopolymn visible light				
IT	Polymers, uses				
	RL: USES (Uses)				
	(photo-, ethylenic, compn. of)				
IT	Siloxanes and Silicones, uses				
	RL: USES (Uses)				
	(acrylate-, photopolymerizable compns. contg. X-62-7192)				
IT	Polymerization catalysts				
	(photochem., amines, phosphines and phosphites contg.)				
IT	Photoimaging compositions and processes				
	(photopolymerizable, photoinitiators for, for UV or visible light exposure)				
IT	Alkenes, polymers				
	RL: USES (Uses)				
	(polymers, photo-, compn. of)				
IT	Amines, uses				
	RL: USES (Uses)				
	(tertiary, photopolymn. initiator compns. contg.)				
IT	4491-03-6D, Bisphenol A diacrylate, ethylene oxide modified 15625-89-5				
	24447-78-7 26403-58-7, Poly(ethylene glycol) acrylate 77641-99-7,				
	Kayarad DPHA 78446-93-2 125147-94-6, Kayarad CL-50 138789-58-9,				
	Kayarad ARC-82 144045-91-0, CM 619 144046-21-9, Kayarad TRA 320				
	RL: USES (Uses)				
	(photopolymerizable compns. contg.)				
IT	3053-68-7, TPPS				
	RL: USES (Uses)				
	(radical generator, TPP-S, photopolymerizable compn. contg.)				
IT	102-71-6, uses 102-79-4, Butyldiethanolamine 102-86-3, Trihexylamine				
	102-87-4, Trilaurylamine 105-59-9, Methyl-diethanolamine 603-35-0,				
	Triphenylphosphine, uses 1656-63-9 2622-14-2, Tricyclohexylphosphine				
	4731-53-7, Trioctylphosphine 7378-99-6, Dimethyloctylamine 7650-89-7,				
	Tribenzylphosphine 40717-21-3 41556-26-7, Sanol LS-765 107119-91-5,				
	Mark LA-62 115055-30-6 122687-44-9 143610-28-0 143610-29-1				
	144045-89-6, Chelex LT 3				
	RL: USES (Uses)				
	(radical generator, photopolymerizable compn. contg.)				

IT 61-73-4 65-61-2, Acridine Orange **81-88-9** 135-49-9, Acridine
Yellow 477-73-6 531-53-3, Azure A 531-55-5, Azure B 553-24-2,
Neutral Red 569-64-2, Malachite Green 581-64-6 989-38-8, Rhodamine
6G 1694-09-3, Acid Violet 5B 2390-54-7 2465-27-2 2580-56-5, Aizen
Victoria Blue BH 2679-01-8, Methylene Green 3056-93-7 3648-36-0
6441-82-3 12217-48-0 12221-86-2, C.I. Basic Yellow 40
RL: USES (Uses)
(sensitizer, **photopolymerizable** compn. contg.)

L7 ANSWER 10 OF 19 CA COPYRIGHT 2002 ACS
 AN 109:46236 CA
 TI Yellow light preexposure for increasing **photospeed** of
photopolymerizable composition
 IN Weed, Gregory C.
 PA du Pont de Nemours, E. I., and Co., USA
 SO U.S., 6 pp.
 CODEN: USXXAM
 DT Patent
 LA English
 IC ICM G03C005-00
 ICS G03C005-04
 NCL 430327000
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other
 Reprographic Processes)
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	US 4716097	A	19871229	US 1986-830509	19860203
	EP 284642	A2	19881005	EP 1987-104915	19870402
	EP 284642	A3	19900711		
	R: DE, FR, GB, IT, SE				
	JP 63262645	A2	19881028	JP 1987-88994	19870413
	BR 8701797	A	19881025	BR 1987-1797	19870414
	CN 87103298	A	19881116	CN 1987-103298	19870501
PRAI	US 1986-830509		19860203		

AB The **photospeed** of a **photopolymerizable** compn.
 comprised of an addn. polymerizable ethylenically unsatd. **monomer**
 , **photoinitiators**, and triarylmethane or xanthene dyes and used
 as a **photoresist** is increased by exposing the
photopolymerizable to light at a wavelength longer than 400 nm and
 at an intensity of at least 1500 lm/m² for a time sufficient to increase
 its **photospeed**. Thus, a **photoresist** compn. comprised
 of Me methacrylate-Et acrylate-methacrylic acid copolymer, Et
 p-dimethylaminobenzoate, poly(ethylene oxide), ethoxylated
 trimethylolpropane triacrylate, diarylated polyurethane, Michler's ketone,
 benzophenone, leuco crystal violet 4,4',4''-methylidyne
 tris-N,N-dimethylaniline, diethylhydroxylamine, 4-trichloromethyl-4-
 methylcyclohexadienone, victoria green, victoria blue, CH₂Cl₂, and MeOH
 was coated on a poly(ethylene terephthalate) support, dried, laminated to
 a poly(ethylene terephthalate) oversheet, exposed to Sylvania Gold
 fluorescent lamps at 27,000 lm/m², and exposed to actinic radiation at 70
 mJ/cm² through a 6.sqroot.2 stouffer 41 stepwedge, the oversheet removed,
 and developed in aq. Na₂CO₃ to show a 1-12 step increase over a control
 contg. no victoria green and victoria blue.

ST **photoresist** sensitization yellow light preexposure;
 triarylmethane dye **photoresist photospeed** increase;
 xanthene dye **photoresist photospeed** increase

IT **Photoimaging** compositions and processes
 (contg. polymerizable unsatd. **monomer** and
photoinitiators and triarylmethane dyes, **photospeed**
 increase of, by preexposure with yellow light)

IT Resists
 (photo-, contg. polymerizable unsatd. **monomer** and
photoinitiators and triarylmethane dyes, **photospeed**
 increase of, by preexposure with yellow light)

IT 15625-89-5D, ethoxylated

RL: USES (Uses)

(**photopolymerizable** compns. contg. **photoinitiators**
 and triarylmethane dyes and, **photospeed** increase of, by
 preexposure with yellow light)

IT 81-88-9 90-94-8, Michler's ketone 119-61-9, Benzophenone,

properties 569-64-2, Victoria Green 603-48-5 2390-60-5 3274-12-2
3710-84-7, Diethylhydroxylamine 10287-53-3, Ethyl p-
dimethylaminobenzoate 25133-97-5, Methylmethacrylate-ethylacrylate-
methacrylic acid copolymer

RL: USES (Uses)

(**photopolymerizable** compns. contg. unsatd. **monomer**
and **photoinitiators** and triarylmethane dyes and,
photospeed increase of, by preexposure with yellow light)

L10 ANSWER 9 OF 44 CA COPYRIGHT 2002 ACS
 AN 135:325177 CA
 TI Optimizing two-**photon** initiators and exposure conditions for
 three-dimensional lithographic microfabrication
 AU Kuebler, Stephen M.; Rumi, Mariacristina; Watanabe, Toshiyuki; Braun,
 Kevin; Cumpston, Brian H.; Heikal, Ahmed A.; Erskine, Lael L.;
 Thayumanavan, S.; Barlow, Stephen; Marder, Seth R.; Perry, Joseph W.
 CS Department of Chemistry, The University of Arizona, Tucson, AZ, 85721, USA
 SO Journal of Photopolymer Science and Technology (2001), 14(4), 657-668
 CODEN: JSTEEW; ISSN: 0914-9244
 PB Technical Association of Photopolymers, Japan
 DT Journal
 LA English
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other
 Reprographic Processes)
 AB The radical **photoinitiation** characteristics of a range of
 D-.pi.-D chromophores (where D is an electron-donor and .pi. is a
 biphenyl, stilbene, or bis(styryl)benzene conjugated bridge) under two-
photon excitation are reported. **Photocrosslinkable**
 resins were formulated with these initiators and were used to fabricate a
 variety of complex three-dimensional structures by two-**photon**
 induced polymn. (TPIP). These structures illustrate that TPIP can be a
 highly versatile technique for the rapid single-step fabrication of
 complex microstructures and devices. The new two-**photon** resins
 were found to be as much as 50 times more sensitive than resins contg.
 conventional UV initiators. The increased two-**photon**
 sensitivity is attributed to the large two-**photon** absorption
 cross-sections and the efficient electron-transfer mediated initiation of
 the polymn. by the D-.pi.-D chromophores. A three-dimensional
 test-structure was used to evaluate how varying the intensity and the
 exposure times affects the shape and dimensions of the polymn. vol.
 element (**voxel**). Conditions were found for which the
voxel could be as small as .apprx.200 nm in width and .apprx.700
 nm in length, even though the wavelength of the two-**photon**
 excitation radiation was 775 nm.
 ST **photopolymn** two **photon** **photoinitiator** three
 dimensional lithog microfabrication; **photocrosslinking** resin
photopolymn two **photon** **photoinitiator** 3D
 lithog
 IT Micromachining
 Microstructure
 Stereolithography
 Two-**photon** absorption
 (optimizing two-**photon** **photopolymn.** initiators and
 exposure conditions for three-dimensional lithog. microfabrication)
 IT Crosslinking
 (**photochem.**; optimizing two-**photon**
photopolymn. initiators and exposure conditions for
 three-dimensional lithog. microfabrication)
 IT Polymerization
 Polymerization catalysts
 (**photopolymn.**, two-**photon**; optimizing two-
photon **photopolymn.** initiators and exposure
 conditions for three-dimensional lithog. microfabrication)
 IT Polymerization kinetics
 (**photopolymn.**; optimizing two-**photon**
photopolymn. initiators and exposure conditions for
 three-dimensional lithog. microfabrication)
 IT Fluorescence quenching
 (rate of bimol. quenching of two-**photon** **photopolymn**
 . acrylate systems in relation to three-dimensional lithog.
 microfabrication)

IT 75577-70-7, SR454
 RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
 (SR454; optimizing two-photon photopolymn. initiators and exposure conditions for three-dimensional lithog. microfabrication)

IT 28961-43-5, SR 9008
 RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
 (SR9008; optimizing two-photon photopolymn. initiators and exposure conditions for three-dimensional lithog. microfabrication)

IT 15546-43-7 65181-78-4 116942-09-7 197633-82-2 202063-32-9
 208263-41-6 208263-42-7 352437-80-0 367522-87-0 367522-88-1
 367522-89-2 367522-90-5 367522-91-6 367522-92-7
 RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
 (photoinitiator; optimizing two-photon photopolymn. initiators and exposure conditions for three-dimensional lithog. microfabrication)

RE.CNT 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD
 RE

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- (4) Cumpston, B; Nature 1999, V398, P51 CA
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- (12) Marcus, R; Biochim Biophys Acta 1985, V811, P265 CA
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L10 ANSWER 12 OF 44 CA COPYRIGHT 2002 ACS

AN 134:179106 CA

TI **Photonic** crystal structures with submicrometer spatial resolution achieved by high-power femtosecond laser-induced **photopolymerization**

AU Sun, Hong-Bo; Xu, Ying; Miwa, Masafumi; Matsuo, Shigeki; Misawa, Hiroaki

CS Satellite Venture Business Lab., Univ. of Tokushima, Tokushima, Japan

SO Proceedings of SPIE-The International Society for Optical Engineering (2000), 3888(High-Power Lasers in Manufacturing), 122-130

CODEN: PSISDG; ISSN: 0277-786X

PB SPIE-The International Society for Optical Engineering

DT Journal

LA English

CC 37-3 (Plastics Manufacture and Processing)

Section cross-reference(s): 73

AB We demonstrate in this paper a fabrication of three-dimensional microstructures using **photopolymn.** of resin by two-**photon** absorption. When a tightly focused laser beam was scanned in a light-curling liq., solidified rods were formed following the trace of the scanning. If the solidification was arranged to occur along the frame of a microstructure, a designed spatial pattern would be transformed into material object. Due to a quadratic dependence of **photopolymn.** rate on the laser pulse energy, the size of solidified **voxels** was controlled down to submicrometer order. IR transmission measurement exhibited pronounced band gap effects from thus-fabricated **photonic** crystal structures.

ST **photonic** crystal structure **photopolymn** resin

IT **Photonic** crystals

(**photonic** crystal structures with submicrometer spatial resolu. achieved by high-power femtosecond laser-induced **photopolymn.**)

IT Polymerization

(**photopolymn.**; **photonic** crystal structures with submicrometer spatial resolu. achieved by high-power femtosecond laser-induced **photopolymn.**)

IT 122392-14-7, Norland Optical Adhesive 60 223382-46-5, Nopcure 800

RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)

(**photonic** crystal structures with submicrometer spatial resolu. achieved by high-power femtosecond laser-induced **photopolymn.**)

RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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L10 ANSWER 26 OF 44 CA COPYRIGHT 2002 ACS
 AN 130:160522 CA
 TI Study of diffusion of **photoacid** generators by laser scanning
 confocal microscopy
 AU Zhang, P. L.; Webber, S.; Mendenhall, J.; Byers, J.; Chao, K.
 CS Department of Chemistry, University of Texas at Austin, Austin, TX, 78712,
 USA
 SO Proc. SPIE-Int. Soc. Opt. Eng. (1998), 3333(Pt. 1, Advances in Resist
 Technology and Processing XV), 794-805
 CODEN: PSISDG; ISSN: 0277-786X
 PB SPIE-The International Society for Optical Engineering
 DT Journal
 LA English
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other
 Reprographic Processes)
 AB Diffusion of the **photogenerated** acid during the period of time
 between exposure and development can cause contrast loss and ultimately
 loss of the latent image. This is esp. relevant for chem. amplified
photoresists that require a post-exposure baking step, which in
 turn facilitates acid diffusion due to the high temp. normally employed.
 It is thus important to develop techniques with good spatial resolu. to
 monitor the **photogeneration** of acid. More precisely, we need
 techniques that provide two distinct types of information: spatial resolu.
 on various length scales within the surface layer and also sufficient
 depth resolu. so that one can observe the transition from very surface
 layer to bulk structure in the polymer blend coated on silicon substrate.
 Herein laser scanning confocal microscopy is used to evaluate the resist
 for the first time. We report the use of the confocal microscopy to map
 the pag/dye distribution in PHS matrixes, with both reflectance images and
 fluorescence images. A laser beam is focused onto a small
 three-dimensional vol. element, termed a **voxel**. It is typically
 200 nm .times. 200 nm laterally and 800 nm axially. The illuminated
voxel is viewed such that only signals emanating from this
voxel are detected, i.e., signal from outside the probed
voxel is not detected. By adjusting the vertical position of the
 laser focal point, the **voxel** can be moved to the designated
 lateral plane to produce an image. Contrast caused by topol. difference
 between the exposed and unexposed area can be eliminated.
 Bis-p-butylphenyl iodonium triflate (7 % of polyhydroxystyrene) is used as
photoacid generators. 5-18 % (By wt., PHS Mn=13k) resist in PGMEA
 soln. is spin cast onto the treated quartz disk with thickness of 1.4
 .mu.m. 5 .mu.M space / 10 .mu.m pitch chrome mask is used to generate the
 pattern with mercury DUV illumination. Fluoresceinamine, the pH-sensitive
 dye, is also used to enhance the contrast of fluorescence image. The
 typical PEB temp. is 90.degree.C for 90 s. 488 Nm is used as the
 excitation wavelength. Both reflectance and fluorescence images (>510 nm)
 are processed by using Adobe **Photoshop**. It was found that the
 reflectance is more sensitive to the change of the refractive index of the
 resist while the fluorescence is more sensitive to the distribution of the
 PAG/dye. The NIH Image software is used for acid exchange rate calcn.
 Second Fick's Law is applied to analyze the image change. The diffusion
 coeff. for this PAG in PHS during PEB is smaller than 8.8 .times. 10⁻¹³
 cm²/s.
 ST diffusion const laser scanning confocal microscope DUV PAG;
photoacid generator diffusion **photoresist**
photolithog
 IT Confocal laser scanning microscopy
 Diffusion
Photolithography
Photoresists
 (study of diffusion of **photoacid** generators by laser scanning
 confocal microscopy)

IT 84563-54-2

RL: PRP (Properties)

(**photoacid** generator; study of diffusion of **photoacid** generators by laser scanning confocal microscopy)

IT 59269-51-1, Poly(hydroxystyrene)

RL: PRP (Properties)

(study of diffusion of **photoacid** generators by laser scanning confocal microscopy)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (5) Zhang, P; Advances in Resist Technology and Processing XIV SPIE 1997, V3049, P898 CA

L15 ANSWER 9 OF 35 CA COPYRIGHT 2002 ACS
 AN 127:115178 CA
 TI Materials and systems for two **photon** 3-D ROM devices
 AU Dvornikov, Alexander S.; Cokgor, Ilkan; Wang, Mark; McCormick, Frederick B., Jr.; Esener, Sadik C.; Rentzepis, Peter M.
 CS Call/Recall Inc., San Diego, CA, 92121, USA
 SO IEEE Trans. Compon., Packag., Manuf. Technol., Part A (1997), 20(2), 203-212
 CODEN: IMTAEZ; ISSN: 1070-9886
 PB Institute of Electrical and Electronics Engineers
 DT Journal
 LA English
 CC 74-12 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
 AB The methods and systems used for storing and accessing information in three dimensions by means of two-**photon** absorption are described. The materials into which the information is stored are org. mols. dispersed in polymer matrixes, which change structure and spectra after absorption of light. The writing and accessing of the information can be performed either bit-by-bit or in a two-dimensional (2-D) multi-bit plane format. Automated recording and readout three-dimensional (3-D) systems have been constructed and characterized. Channel error sources have been identified, and a custom spatial bit-error-rate test has been developed.
 ST optical memory device nitronaphthaldehyde Rhodamine PMMA;
photochromic Rhodamine **dye** 3D ROM device
 IT Fluorescence
 Optical memory devices
 Optical recording
Photochromic materials
 ROM devices
 (3D ROM devices using nitro-naphthaldehyde as acid generator and Rhodamine B base as **dye** precursor in solid PMMA **matrix**)
 IT 9011-14-7, PMMA
 RL: DEV (Device component use); USES (Uses)
 (3D ROM devices using nitro-naphthaldehyde as acid generator and Rhodamine B base as **dye** precursor in solid PMMA **matrix**)
 IT 509-34-2, Rhodamine B base 101327-84-8, 1-Nitro-2-naphthaldehyde
 RL: DEV (Device component use); RCT (Reactant); USES (Uses)
 (3D ROM devices using nitro-naphthaldehyde as acid generator and Rhodamine B base as **dye** precursor in solid PMMA **matrix**)
 IT **81-88-9**, Rhodamine B
 RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
 (3D ROM devices using nitro-naphthaldehyde as acid generator and Rhodamine B base as **dye** precursor in solid PMMA **matrix**)

L6 ANSWER 1 OF 4 CA COPYRIGHT 2002 ACS
 AN 133:81488 CA
 TI Three-dimensional **optical** data storage in a fluorescent
 dye-doped photopolymer
 AU Wang, Mark M.; Esener, Sadik C.
 CS Department of Electrical and Computer Engineering, University of
 California at San Diego, La Jolla, CA, 92093, USA
 SO Applied Optics (2000), 39(11), 1826-1834
 CODEN: APOPAI; ISSN: 0003-6935
 PB Optical Society of America
 DT Journal
 LA English
 CC 74-12 (Radiation Chemistry, Photochemistry, and Photographic and Other
 Reprographic Processes)
 AB The authors propose a new monolithic multilayer **optical** storage
 medium in which data may be stored through the diffusional redistribution
 of fluorescent mols. within a polymer host. The active portion of the
 medium consists of a photopolymer doped with a fluorescent **dye**
 that is polymd. at the focal point of a high-numerical-aperture lens. As
 the fluorescent mols. bond to the polymer matrix they become more highly
 concd. in the polymd. regions, resulting in the modulated data pattern.
 Since data readout is based on detection of fluorescence rather than index
 modulation as in other photopolymer-based memories, the problems of media
 shrinkage and **optical** scatter are of less concern. An intensity
 threshold obsd. in the recording response of this material due to the
 presence of inhibitor mols. in the photopolymer allows for the 3-D
 confinement of recorded bits and therefore multilayer recording. The
 nonlinear recording characteristics of this material were studied through
 a simple model of photopolymn. and diffusion and verified exptl. Both
 single-layer and multilayer recordings were demonstrated.
 ST **optical** storage **dye** doped photopolymer
 IT Information systems
 (optical storage; three-dimensional **optical** data
 storage in a fluorescent **dye**-doped photopolymer)
 IT Polymerization
 (photopolymn.; three-dimensional **optical** data storage in a
 fluorescent **dye**-doped photopolymer)
 IT Fluorescence
 Fluorescent dyes
 Optical memory devices
 Optical recording
 Simulation and Modeling, physicochemical
 (three-dimensional **optical** data storage in a fluorescent
dye-doped photopolymer)
 IT Polymers, uses
 RL: NUU (Other use, unclassified); TEM (Technical or engineered material
 use); USES (Uses)
 (three-dimensional **optical** data storage in a fluorescent
dye-doped photopolymer)
 IT 10373-78-1, Camphor quinone
 RL: MOA (Modifier or additive use); NUU (Other use, unclassified); USES
 (Uses)
 (photosensitizer; three-dimensional **optical** data storage in a
 fluorescent **dye**-doped photopolymer)
 IT 105759-55-5, Dipentaerythritol pentaacrylate-1-vinyl-2-pyrrolidinone
 copolymer
 RL: NUU (Other use, unclassified); TEM (Technical or engineered material
 use); USES (Uses)
 (three-dimensional **optical** data storage in a fluorescent
dye-doped photopolymer)
 RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD
 RE

- (1) Betzig, E; Appl Phys Lett 1992, V61, P142 CA
- (2) Chinn, S; Opt Lett 1996, V21, P899
- (3) Colburn, W; Appl Opt 1971, V10, P1636 CA
- (4) Dhar, L; Opt Lett 1998, V23, P1710 CA
- (5) Gyulnazarov, E; Opt Spectrosc 1990, V69, P109
- (6) Heanue, J; Science 1994, V265, P749
- (7) Kawata, Y; Appl Opt 1996, V35, P2466
- (8) Odian, G; Principles of Polymerization 1991
- (9) Parthenopoulos, D; Science 1989, V245, P843 CA
- (10) Psaltis, D; Sci Am 1995, V273(5), P70
- (11) Rosen, H; Proc SPIE 1995, V2514, P14
- (12) Steckman, G; Opt Lett 1998, V23, P1310 CA
- (13) Strickler, J; Opt Lett 1991, V16, P1780 CA
- (14) Sutherland, R; Chem Mater 1993, V5, P1533 CA
- (15) Terris, B; Appl Phys Lett 1996, V68, P141 CAPLUS
- (16) Ueki, H; Appl Opt 1996, V35, P2457 CA
- (17) Wang, M; Opt Lett 1997, V22, P558

L9 ANSWER 4 OF 19 CA COPYRIGHT 2002 ACS
AN 132:286218 CA
TI Two-photon holography in 3-D **photopolymer** host-guest matrix
AU Diamond, Cornelius; Boiko, Yuri; Esener, Sadik
CS Department of Physics, University of California, San Diego, La Jolla, CA, 92093, USA
SO Optics Express [Electronic Publication] (2000), 6(3), 64-68
CODEN: OPEXFF; ISSN: 1094-4087
URL: <http://epubs.osa.org/oearchive/pdf/18896.pdf>
PB Optical Society of America
DT Journal; (online computer file)
LA English
CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
AB The authors demonstrate for the first time two-photon induced holog. recording at an arbitrary point in three dimensional **photopolymeric** cube by overlapping two coherent pulses from a 200 fs Ti:Sapphire tunable laser operating at 710 nm. Spatial overlap is achieved by a novel pupil division method. The polymer material is made of epoxy host, which is fully polymd. and filled with liq. **photopolymerizable** formulation comprising acrylate type monomer and two-photon **photoinitiator**. Measured diffraction efficiency is measured to be 3.5%.
ST two **photon** induced holog recording **photopolymer** host guest matrix
IT Polymerization
 (**photopolymn.**; two-photon holog. in 3-D **photopolymer** host-guest matrix)
IT Holographic recording materials
 Holography
 (two-photon holog. in 3-D **photopolymer** host-guest matrix)
IT Epoxy resins, processes
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (two-photon holog. in 3-D **photopolymer** host-guest matrix)
IT 107461-03-0, Epotek-301
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (matrix; two-photon holog. in 3-D **photopolymer** host-guest matrix)
IT 77641-99-7, Dipentaerythritol acrylate
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (monomer; two-photon holog. in 3-D **photopolymer** host-guest matrix)
IT 28961-43-5
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (polymeric guest-host system; two-photon holog. in 3-D **photopolymer** host-guest matrix)
IT 24650-42-8D, deriv.
 RL: PEP (Physical, engineering or chemical process); PROC (Process)
 (two-photon initiator; two-photon holog. in 3-D **photopolymer** host-guest matrix)
RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Bjorklund, G; Opt Lett 1980, V6, P159
(2) Brauchle, C; Opt Lett 1982, V7, P177
(3) Cumpston, B; Mat Res Soc Symp Proc 1998, V488, P217 CA
(4) Diamond, C; Thesis University of California 2000
(5) Dvornikov, A; Opt Commun 1995, V119, P341 CAPLUS
(6) Epoxy Technology Inc; Fully cured refractive index was measured to be 1.54
(7) Kewitsch, A; Opt Lett 1996, V21, P24 CA

(8) Toriumi, A; Opt Lett 1998, V23, P1924

(9) von der Linde, D; Appl Phys Lett 1974, V25, P155 CA

L9 ANSWER 3 OF 19 CA COPYRIGHT 2002 ACS
 AN 134:340727 CA
 TI Threshold enhancement in two-**photon photopolymerization**
 AU Boiko, Yuri B.; Bowen, M. Shane; Wang, Mark M.; Costa, Joannes M.;
Esener, Sadik C.
 CS Electrical and Computer Engineering Department, University of California
 at San Diego, La Jolla, CA, 92093, USA
 SO Proceedings of SPIE-The International Society for Optical Engineering
 (2000), 4097(Complex Mediums), 254-263
 CODEN: PSISDG; ISSN: 0277-786X
 PB SPIE-The International Society for Optical Engineering
 DT Journal
 LA English
 CC 35-3 (Chemistry of Synthetic High Polymers)
 AB It is demonstrated that threshold redn. of two-**photon** polymn. is
 achievable by means traditionally employed for sensitivity enhancement for
 single **photon photoinitiation**, such as heavy atom
 enhancement or intersystem crossing, electron donor agent, concn. increase
 of initiator. It is shown that measured threshold is in reverse
 proportion to square root of initiator concn., whereas obsd. length of
 induction period exhibits reverse proportionality to the square of light
 intensity. Overall, exptl. obsd. threshold values of two-**photon**
 induced **photopolymer** are effected by all intermediate stages of
 energy transformation in the **photochem.** sequences leading to
photoinitiation, in particular inter-system crossing of excited
 initiating mols. as well as by monomer reactivity.
 ST threshold enhancement two **photon photopolymer**
 IT Polymerization
 (**photopolymer**; threshold enhancement in two-**photon**
photopolymer.)
 IT 25085-98-7P 82200-28-0P, Dipentaerythritol pentaacrylate homopolymer
 RL: SPN (Synthetic preparation); PREP (Preparation)
 (threshold enhancement in two-**photon photopolymer**.)
 RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD
 RE
 (1) Kuebler, S; Proceedings of the SPIE 2000, V3937, P97 CA
 (2) Manivannan, G; J Polym Sci (A): Polym Chem 1991, V29, P1113 CA

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Substances (PICCS) has been added to CHEMLIST

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Structure search limits have been increased. See HELP SLIMIT for details.

=> s dipentaerythritol pentaacrylate

636 DIPENTAERYTHRITOL
71 PENTAACRYLATE
L1 66 DIPENTAERYTHRITOL PENTAACRYLATE
(DIPENTAERYTHRITOL(W) PENTAACRYLATE)

=> s dipentaerythritol pentaacrylate/cn

L2 1 DIPENTAERYTHRITOL PENTAACRYLATE/CN

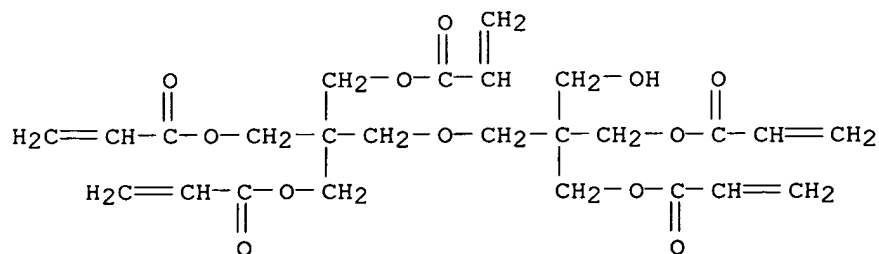
=> d

L2 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2000 ACS
RN 60506-81-2 REGISTRY
CN 2-Propenoic acid, 2-[[3-hydroxy-2,2-bis[[[(1-oxo-2-

propenyl)oxy)methyl]propoxy)methyl]-2-[[[(1-oxo-2-propenyl)oxy)methyl]-1,3-propanediyl ester (9CI) (CA INDEX NAME)

OTHER NAMES:

CN Chemlink 9041
CN **Dipentaerythritol pentaacrylate**
CN DPHPA
CN Sartomer 399
CN Sartomer 9041
CN SR 399
CN SR 399D
CN SR 399E
CN SR 9041
FS 3D CONCORD
DR 122269-29-8, 125913-45-3, 115083-64-2, 78949-72-1
MF C25 H32 O12
CI COM
LC STN Files: AGRICOLA, BIOSIS, CA, CAPLUS, CHEMCATS, CHEMLIST, CSCHEM, IFICDB, IFIPAT, IFIUDB, MSDS-OHS, TOXLINE, TOXLIT, USPATFULL
Other Sources: DSL**, EINECS**, TSCA**
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392 REFERENCES IN FILE CA (1967 TO DATE)
60 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
394 REFERENCES IN FILE CAPLUS (1967 TO DATE)

=> s 1 vinyl 2 pyrrolidinone

10483329 1
59980 VINYL
11647575 2
24731 PYRROLIDINONE
L3 343 1 VINYL 2 PYRROLIDINONE
(1(W)VINYL(W)2(W)PYRROLIDINONE)

=> s 1 vinyl 2 pyrrolidinone/cn

L4 0 1 VINYL 2 PYRROLIDINONE/CN

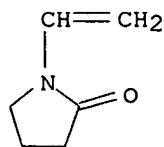
=> d 343

L4 HAS NO ANSWERS

L4 0 SEA FILE=REGISTRY 1 VINYL 2 PYRROLIDINONE/CN

=> d 13 343

L3 ANSWER 343 OF 343 REGISTRY COPYRIGHT 2000 ACS
RN 88-12-0 REGISTRY
CN 2-Pyrrolidinone, 1-ethenyl- (9CI) (CA INDEX NAME)
OTHER CA INDEX NAMES:
CN 2-Pyrrolidinone, 1-vinyl- (7CI, 8CI)
OTHER NAMES:
CN 1-Ethenyl-2-pyrrolidinone
CN **1-Vinyl-2-pyrrolidinone**
CN 1-Vinyl-2-pyrrolidone
CN Aronix M 150
CN N-Vinyl-2-pyrrolidinone
CN N-Vinyl-2-pyrrolidone
CN N-Vinylpyrrolin-2-one
CN V-Pyrol
CN V-Pyrol RC
CN Vinylbutyrolactam
FS 3D CONCORD
DR 94800-10-9, 153631-60-8
MF C6 H9 N O
CI COM
LC STN Files: AGRICOLA, ANABSTR, APILIT, APILIT2, APIPAT, APIPAT2,
BEILSTEIN*, BIOBUSINESS, BIOSIS, BIOTECHNO, CA, CANCERLIT, CAOLD,
CAPLUS, CASREACT, CBNB, CHEMCATS, CHEMINFORMRX, CHEMLIST, CHEMSAFE,
CIN,
CSCHEM, CSNB, DETHERM*, EMBASE, GMELIN*, HODOC*, IFICDB, IFIPAT,
IFIUDB,
IPA, MEDLINE, MRCK*, MSDS-OHS, NIOSHTIC, PIRA, PROMT, RTECS*, SPECINFO,
TOXLINE, TOXLIT, TULSA, USPATFULL, VTB
(*File contains numerically searchable property data)
Other Sources: DSL**, EINECS**, TSCA**
(**Enter CHEMLIST File for up-to-date regulatory information)



2392 REFERENCES IN FILE CA (1967 TO DATE)
814 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
2396 REFERENCES IN FILE CAPLUS (1967 TO DATE)
4 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

=> s 88-12-0

L5 1 88-12-0
(88-12-0/RN)

=> s n phenyl glycine/cn

L6 0 N PHENYL GLYCINE/CN

=> s n phenyl glycine

3228847 N
6251865 PHENYL
127769 GLYCINE
L7 89 N PHENYL GLYCINE
(N(W) PHENYL(W) GLYCINE)

=> d 89

L7 ANSWER 89 OF 89 REGISTRY COPYRIGHT 2000 ACS
RN 103-01-5 REGISTRY
CN Glycine, N-phenyl- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)
OTHER NAMES:
CN (Phenylamino)acetic acid
CN Acetic acid, (phenylamino)-
CN Anilinoacetic acid
CN N-(Phenylamino)acetic acid
CN **N-Phenylglycine**
FS 3D CONCORD
MF C8 H9 N O2
CI COM
LC STN Files: BEILSTEIN*, BIOBUSINESS, BIOSIS, BIOTECHNO, CA, CANCERLIT,
CAOLD, CAPLUS, CASREACT, CBNB, CHEMCATS, CHEMLIST, CSCHEM, DETHERM*,
EMBASE, GMELIN*, HODOC*, IFICDB, IFIPAT, IFIUDB, MEDLINE, MRCK*,
MSDS-OHS, PIRA, SPECINFO, TOXLINE, TOXLIT, USPATFULL
(*File contains numerically searchable property data)
Other Sources: EINECS**, NDSL**, TSCA**
(**Enter CHEMLIST File for up-to-date regulatory information)

PhNH-CH₂-CO₂H

483 REFERENCES IN FILE CA (1967 TO DATE)
42 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA
484 REFERENCES IN FILE CAPLUS (1967 TO DATE)
33 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

=> s 103-01-5

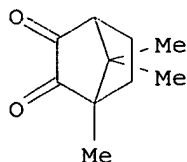
L8 1 103-01-5
(103-01-5/RN)

=> s camphorquinone/cn

L9 1 CAMPHORQUINONE/CN

=> d

L9 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2000 ACS
RN 10373-78-1 REGISTRY
CN Bicyclo[2.2.1]heptane-2,3-dione, 1,7,7-trimethyl- (9CI) (CA INDEX NAME)
OTHER CA INDEX NAMES:
CN 2,3-Bornanedione, (.+-.)- (8CI)
CN Bicyclo[2.2.1]heptane-2,3-dione, 1,7,7-trimethyl-, (.+-.)-
OTHER NAMES:
CN (.+-.)-Camphorquinone
CN 1,7,7-Trimethylbicyclo[2.2.1]heptane-2,3-dione
CN Camphoquinone
CN Camphoroquinone
CN **Camphorquinone**
CN dl-2,3-Camphanedione
CN dl-Camphorquinone
FS 3D CONCORD
DR 465-29-2
MF C10 H14 O2
CI COM
LC STN Files: AGRICOLA, BEILSTEIN*, BIOBUSINESS, BIOSIS, BIOTECHNO, CA,
CAOLD, CAPLUS, CASREACT, CBNB, CHEMCATS, CHEMINFORMRX, CHEMLIST, CIN,
CSCHEM, EMBASE, GMELIN*, IFICDB, IFIPAT, IFIUDB, IPA, MEDLINE,
MSDS-OHS,
PIRA, SPECINFO, TOXLINE, TOXLIT, USPATFULL
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190 REFERENCES IN FILE CA (1967 TO DATE)
193 REFERENCES IN FILE CAPLUS (1967 TO DATE)
1 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

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SQIDE3 - Same as SQIDE, but 3-letter amino acid codes are used
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ISTD -- STD format, indented

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OIBIB ----- OBIB, indented with text labels

SBIB ----- BIB, no citations
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FILE 'REGISTRY' ENTERED AT 16:25:01 ON 12 OCT 2000

L1 66 S DIPENTAERYTHRITOL PENTAACRYLATE
L2 1 S DIPENTAERYTHRITOL PENTAACRYLATE/CN
L3 343 S 1 VINYL 2 PYRROLIDINONE
L4 0 S 1 VINYL 2 PYRROLIDINONE/CN
L5 1 S 88-12-0
L6 0 S N PHENYL GLYCINE/CN
L7 89 S N PHENYL GLYCINE
L8 1 S 103-01-5
L9 1 S CAMPHORQUINONE/CN

=> file ca

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FILE LAST UPDATED: 6 Oct 2000 (20001006/ED)

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=> s 12 and 15 and 18 and 19

393 L2
2393 L5
483 L8
698 L9

L10 1 L2 AND L5 AND L8 AND L9

=> d all

L10 ANSWER 1 OF 1 CA COPYRIGHT 2000 ACS

AN 122:20290 CA

TI Development of photopolymer-liquid crystal composite materials for dynamic

hologram applications

AU Sutherland, Richard L.; Natarajan, Lalgudi V.; Tondiglia, Vincent P.; Bunning, Timothy J.; Adams, W. Wade

CS Science Applications International Corporation, Dayton, OH, 45431, USA

SO Proc. SPIE-Int. Soc. Opt. Eng. (1994), 2152 (DIFFRACTIVE AND HOLOGRAPHIC OPTICS TECHNOLOGY), 303-13

CODEN: PSISDG; ISSN: 0277-786X

DT Journal

LA English

CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

AB Switchable holog. gratings are desirable for a wide range of applications in diffractive optics. Liq. cryst. materials look attractive for these devices because of their large field-induced birefringence. The combination of electrooptical liq. crystals with photopolymeric holog. materials offers a unique single system approach to the economical fabrication of switchable holograms. We report on the progress in our development of a novel system where holog. gratings are recorded in a single step process and consist of periodic polymer-dispersed liq.

crystal

planes. Gratings have been recorded with high diffraction efficiency (approaching 100%) and narrow angular selectivity (<1.degree. FWHM). The diffraction efficiency can be controlled elec. or thermally.

ST photopolymerizing liq crystal composite dynamic holog; polymer dispersed liq crystal holog recording

IT Holography

(diffraction gratings, dynamic; photopolymg. compn. for dynamic holog. recording contg. acrylate monomers and liq. crystal E7 and initiators)

IT Diffraction gratings
(holog., dynamic; photopolymer compn. for dynamic holog. recording
contg. acrylate monomers and liq. crystal E7 and initiators)

IT 61-73-4, Methylene Blue 88-12-0, uses 103-01-5,
N-Phenylglycine 124-07-2, Octanoic acid, uses 465-29-2,
Camphorquinone 11121-48-5, Rose Bengal 60506-81-2,
Dipentaerythritolhydroxy pentaacrylate 63748-28-7, E7
RL: TEM (Technical or engineered material use); USES (Uses)
(photopolymer compn. for dynamic holog. recording contg. acrylate
monomers and liq. crystal E7 and initiators)

=> file uspat

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	2.82	56.95
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CA SUBSCRIBER PRICE	-0.53	-0.53

FILE 'USPATFULL' ENTERED AT 16:29:12 ON 12 OCT 2000
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FILE COVERS 1971 TO PATENT PUBLICATION DATE: 10 Oct 2000 (20001010/PD)
FILE LAST UPDATED: 10 Oct 2000 (20001010/ED)
HIGHEST PATENT NUMBER: US6131192
CA INDEXING IS CURRENT THROUGH 10 Oct 2000 (20001010/UPCA)
ISSUE CLASS FIELDS (/INCL) CURRENT THROUGH: 10 Oct 2000 (20001010/PD)
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Jul 2000
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Jul 2000

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>>> fields. This thesaurus includes catchword terms from the <<<
>>> USPTO/MOC subject headings and subheadings. Thesauri are also <<<
>>> available for the WIPO International Patent Classification <<<
>>> (IPC) Manuals, editions 1-6, in the /IC1, /IC2, /IC3, /IC4, <<<
>>> /IC5, and /IC6 fields, respectively. The thesauri in <<<
>>> the /IC5 and /IC6 fields include the corresponding catchword <<<
>>> terms from the IPC subject headings and subheadings. <<<

This file contains CAS Registry Numbers for easy and accurate
substance identification.

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(FILE 'HOME' ENTERED AT 16:24:54 ON 12 OCT 2000)

FILE 'REGISTRY' ENTERED AT 16:25:01 ON 12 OCT 2000

L1 66 S DIPENTAERYTHRITOL PENTAACRYLATE
L2 1 S DIPENTAERYTHRITOL PENTAACRYLATE/CN
L3 343 S 1 VINYL 2 PYRROLIDINONE
L4 0 S 1 VINYL 2 PYRROLIDINONE/CN
L5 1 S 88-12-0
L6 0 S N PHENYL GLYCINE/CN
L7 89 S N PHENYL GLYCINE

L8 1 S 103-01-5
L9 1 S CAMPHORQUINONE/CN

FILE 'CA' ENTERED AT 16:27:45 ON 12 OCT 2000
L10 1 S L2 AND L5 AND L8 AND L9

FILE 'USPATFULL' ENTERED AT 16:29:12 ON 12 OCT 2000

=> s 110

169 L2
618 L5
92 L8
134 L9
L11 0 L2 AND L5 AND L8 AND L9

=> s 12 and (rhodamine b or bodipy red)

169 L2
8738 RHODAMINE
1347769 B
2934 RHODAMINE B
(RHODAMINE (W) B)
162 BODIPY
172779 RED
0 BODIPY RED
(BODIPY (W) RED)
L12 4 L2 AND (RHODAMINE B OR BODIPY RED)

=> d all 1-4

L12 ANSWER 1 OF 4 USPATFULL
AN 2000:47023 USPATFULL
TI Visible radiation sensitive composition and recording material
producibile therefrom
IN Baumann, Harald, Dessau, Germany, Federal Republic of
Timpe, Hans-Joachim, Osterode, Germany, Federal Republic of
Herting, Hans-Peter, Osterode, Germany, Federal Republic of
PA Kodak Polychrome Graphics LLC, Norwalk, CT, United States (U.S.
corporation)
PI US 6051366 20000418
AI US 1995-450968 19950525 (8)
PRAI DE 1994-4418645 19940527
DT Utility
REP US 4069054 Jan 1978 430/919.000 Smith
US 4175963 Nov 1979 430/281.000 Crivello
US 4548891 Oct 1985 430/283.100 Riediker et al.
US 4590287 May 1986 556/053.000 Riediker et al.
US 4713401 Dec 1987 522/065.000 Riediker et al.
US 4857654 Aug 1989 556/053.000 Riediker et al.
US 4921827 May 1990 502/167.000 Ali et al.
US 4960746 Oct 1990 430/281.000 Husler et al.
US 4963470 Oct 1990 430/281.100 Klingert et al.
US 4971892 Nov 1990 430/281.000 Ali et al.
US 5011755 Apr 1991 430/281.000 Rohde et al.
US 5049479 Sep 1991 430/271.000 Zertani et al.
US 5049481 Sep 1991 430/283.100 Okamoto et al.
US 5086086 Feb 1992 522/025.000 Brown-Wensley et al.
US 5106722 Apr 1992 430/325.000 Husler et al.
US 5147900 Sep 1992 430/281.000 Palazzotto et al.
US 5229253 Jul 1993 430/284.000 Zertani et al.
US 5378579 Jan 1995 430/281.100 Arimatsu et al.
US 5629354 May 1997 522/025.000 West et al.
CA 2038284 Mar 1991 G03F007-27

CA 2041191 Oct 1991
CA 2097038 Nov 1993
REN D.B. Yang et al, "Inorganic and Organometallic Photoinitiators" in
NY Radiation Curing: Science and Technology, S.P. Pappas, Ed, Plenum, NY,
1992, pp. 21-55.
The Sigma-Aldrich Handbook of Stains, Dyes and Indicators, F.J. Green,
Aldrich Chemical Co., Milwaukee, Wisconsin, 1990, Victoria Blue (lines
missing on pages and no page numbers given or found.
Photochemistry of Dyed and Pigmented Polymers, N.S. Allen & J.F.
McKeller, eds, Applied Science Publishers, London, 1980, p. 210-213.
Farbstoff [Dyes], Schweizer, 1964, pp. 247-251 and 258-260. (In
German-English translation of "relevant passage" given.
B.M. Monroe, in Radiation Curing: Science and Technology, S.P. Pappas,
ed., Plenum Press, New York, 1992, p. 420.
S.P. Pappas, Ed., Plenum, New York, 1992, pp. 21-55.
J. Finter, et al., Makromol. Chem. Macromol. Symp. 24, 177-187 (1989).
D.F. Eaton, Photo. Sci & Eng., 23(3), 150-154 (1979).
B.M. Monroe and G.C. Weed, Chem Rev., 93, 435-448 (1993).
EXNAM Primary Examiner: Hamilton, Cynthia
LREP Ratner & Prestia
CLMN Number of Claims: 10
ECL Exemplary Claim: 1,6
DRWN No Drawings
AB A visible radiation sensitive composition is described which comprises
a
binder, one or more polymerizable compounds containing at least one
polymerizable group, and one or more dyes having an absorption range in
the emission range of the radiation source, characterized in that said
composition comprises as an initiator an initiator system consisting of
a metallocene as a photoinitiator and an onium compound as a
coinitiator. The visible radiation sensitive composition shows an
increased radiation sensitivity compared to the known radiation
sensitive compositions and is especially suitable for recording
materials such as printing plates, which can, in particular, also be
exposed by means of laser radiation in the visible range.
SUMM FIELD OF THE INVENTION
The invention relates to a visible radiation sensitive composition with
a novel initiator system comprising a metallocene compound as a
photoinitiator and an onium compound as a coinitiator. The visible
radiation sensitive compositions according to the present invention are
especially made use of for printing plates and in the field of
photoresist technology.
BACKGROUND OF THE INVENTION
Visible radiation sensitive compositions have been used for years in
photopolymerizable compositions for the production of visible radiation
sensitive materials, such as for example printing plates. In particular
for novel techniques (i.e. exposure by means of lasers) an improved
sensitivity is required, in particular within the visible range of the
spectrum, in order to shorten the duration of the exposure. From an
economical point of view, it is also important that low-intensity
lasers
can be used which are less expensive and more reliable than
high-intensity lasers. Therefore, attempts have been made for quite
some
time to increase the sensitivity of visible radiation sensitive
compositions which are to be used in photopolymerizable compositions.
It is known that the radical polymerization of ethylenically
unsaturated
compounds can be initiated by radiation with visible light in the

presence of photoreducible dyes and reduction agents, such as for example amines (U.S. Pat. No. 3,097,096). EP-A-122 223 discloses photoinitiators and photopolymerizable compositions which contain metallocenes. By means of such metallocenes it was possible to increase the sensitivity of the photopolymerizable layer and to thus reduce the necessary duration of exposure and the required power of the radiation source. Efforts were also made to obtain improved results by using further modified metallocenes, for example in EP-A-401 165, U.S. Pat. No. 4,590,287, EP-A-255 486, EP-A-256 981 and U.S. Pat. No. 5,106,722.

one DE-A-40 08 815 describes a photopolymerizable composition comprising a polymeric binder, a radically polymerizable compound with at least one polymerizable group and at least one photooxidizable group in the molecule as well as a metallocene as a photoinitiator.

In order to obtain a further increase in sensitivity, an attempt was made to use the metallocene together with a coinitiator. EP-B-269 573 for example discloses liquid mixtures of photoinitiators using solutions

of titanocene compounds in liquid photoinitiators of the .alpha.-hydroxy and .alpha.-aminoacetophenone derivative type. DE-A-38 32 032 describes a photopolymerizable mixture comprising a polymeric binder, a radically polymerizable compound with at least one polymerizable group, a photoreducible dye and a metallocene as an initiator as well as a coinitiator. The coinitiator is a trihalogenemethyl compound cleavable by radiation, which is to be used for increasing the visible radiation sensitivity. Those compounds having a triazine ring in the basic structure which carries two trihalogenemethyl groups are preferred.

DE-A-40 13 358 describes a special process for the production of printing plates or photoresists wherein metallocenes are used as photoinitiators, which is aimed at the improvement of photosensitivity.

to U.S. Pat. No. 3,717,558 relates to metallocenes of elements belonging to the subgroups of the periodic table in combination with a further photoinitiator having an activated halogene-containing group for use in photopolymerizable recording material. These initiator combinations, however, are very oxygen- and hydrolysis-sensitive and are therefore hardly suitable for the production of printing plates and photoresist materials.

are It is also known to use a combination of special organometal compounds and onium salts in a hardening agent for polymerizable compositions (U.S. Pat. No. 5,086,086). In this connection, organometal compounds

used as metallocenes, whose essential feature is that they comprise at least one metal-metal-sigma-bond, i.e. that at least two transition metal atoms are present in a complex. The curing agents of U.S. Pat.

No. 5,086,086 are not used in combination with dyes for light-induced polymerisation.

U.S. Pat. No. 4,971,892 discloses photopolymerizable compositions which are especially suitable for printing plates and which are supposed to show a high degree of sensitivity towards visible radiation. As an initiator system for the radical polymerisation, these photopolymerizable compositions comprise an initiator selected from diaryliodonium salts, halogenated triazines and triarylsulfonium salts as well as a specific merocyanine dye.

Even though progress has been made in increasing the visible radiation sensitivity of photopolymerizable compositions, there is still a demand

an

for compositions with further improved properties, in particular with increased photosensitivity.

SUMMARY OF THE INVENTION

have

It is therefore an object of the invention to provide novel photopolymerizable compositions which show improved properties compared to the compositions known in the prior art, in particular an improved photosensitivity, and which are suitable for the production of printing plates with a high impression performance and of photoresists with a high degree of resistance against processing fluids in a cured state, which consist of a simple and thus economical composition and which favorable thermal storage stability.

This object is achieved by a visible radiation sensitive composition which comprises as main components

a) a binder,

b) one or more polymerizable compounds containing at least one polymerizable group,

to

c) one or more dyes having an absorption in the range of about 250 nm about 700 nm,

d) at least one metallocene, the central atom of which is a metal atom taken from the fourth subgroup of the periodic table of the elements, and

e) at least one onium compound.

The invention also relates to a visible radiation sensitive recording material, wherein the visible radiation sensitive composition according to the present invention is applied to a carrier.

DET D DETAILED DESCRIPTION OF THE INVENTION

The binders to be used are not restricted in any way and can be selected

by the person skilled in the art in the known manner for the individual applications. Water-insoluble oligomers and polymers which are soluble in aqueous-alkaline media as disclosed in DE-A-40 08 815 are preferred. Especially preferred are binders comprising carboxyl groups, e.g. copolymers of (meth)acrylic acid and/or unsaturated homologues thereof such as crotonic acid, copolymers of maleic acid anhydride or the semi-esters thereof, products of the reaction

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in

Polymerizable compounds, which can be used for the visible radiation sensitive compositions according to the invention are also known in the prior art and can be selected by the person skilled in the art for the desired application of the visible radiation sensitive compositions according to the present invention based on his general knowledge. Polymerizable compounds suitable for the purpose of the present invention are described e.g. in EP-A-445 624, U.S. Pat. No. 2,760,863 and U.S. Pat No. 3,060,023. In particular the document EP-A-445 624 offers a helpful listing of polymerizable compounds which can be used the visible radiation sensitive compositions of the present invention (cf. e.g. page 4, line 17 to page 7, line 14).

Most preferred are polymerizable compounds containing radically polymerizable olefinic double bonds.

The dyes which can be used in the compositions according to the invention are dyes known in this technical field which are also mentioned in EP-A-445 624. Suitable dyes are therefore in particular xanthene, benzoxanthene, benzothioxanthene, thiazine, pyronine, u

=> d pn ab kwic 1-4

L12 ANSWER 1 OF 4 USPATFULL

PI US 6051366 20000418

AB A visible radiation sensitive composition is described which comprises a

binder, one or more polymerizable compounds containing at least one polymerizable group, and one or more dyes having an absorption range in the emission range of the radiation source, characterized in that said composition comprises as an initiator an initiator system consisting of a metallocene as a photoinitiator and an onium compound as a coinitiator. The visible radiation sensitive composition shows an increased radiation sensitivity compared to the known radiation sensitive compositions and is especially suitable for recording materials such as printing plates, which can, in particular, also be exposed by means of laser radiation in the visible range.

DETD . . . 1

1.94 parts of the acrylic resin Ioncryn .RTM. 683 of the company Johnson Polymer (acid number 150)

0.1 parts **Rhodamine B**

0.45 parts 4,4'-bis-dodecylphenyliodonium-hexafluorophosphate

0.25 parts dicyclopentadienyl-bis-pentafluorophenyl-zirconium

60 parts methylethylketone

52.5 parts methyl glycol

37.5 parts methanol

IT 81-88-9, Rhodamine B 989-38-8, Rhodamine 6G 6359-04-2, Methyleosin 6359-05-3, Ethyleosin 25035-81-8, Methacrylic acid-methyl methacrylate-styrene copolymer **60506-81-2**, Dipentaerythritol pentaacrylate 161279-62-5, Joncryn 683 (visible light-sensitive photopolymerizable compns. contg. metallocene and onium salt initiators and)

L12 ANSWER 2 OF 4 USPATFULL

PI US 6037094 20000314

AB A photosensitive material including a support having a layer of photosensitive microcapsules on the surface thereof, the photosensitive microcapsules including an internal phase containing a photosensitive composition and a color precursor wherein, upon image-wise exposing the photosensitive material and rupturing the microcapsules, the color precursor is image-wise released from the microcapsules to form a color image, the photosensitive material further including a superabsorbent polymer or hydrogel, is disclosed.

SUMM . . . 3,3-bis(p-dimethylaminophenyl)phthalide, 3-(p-dimethylaminophenyl)-3-(1,2 dimethylindole-3-yl)phthalide, 3-(p-dimethylaminophenyl)-3-(2-methylindole-3-yl)phthalide, 3-(p-dimethylaminophenyl)-3-(2-phenylindole-3-yl)phthalide, 3,3-bis(1,2-dimethylindole-3-yl)-5-dimethylaminophthalide, 3,3-bis-(1,2-dimethylindole-3-yl)-6-dimethylaminophthalide, 3,3-bis-(9-ethylcarbazole-3-yl)-5-dimethylaminophthalide, 3,3-bis(2-phenylindole-3-yl)-5-dimethylaminophthalide, 3-p-dimethylaminophenyl-3-(1-methyl pyrrole-2-yl)-6-dimethylaminophthalide, 4,4'-bis-dimethylaminobenzhydrin benzyl ether, N-halophenyl leuco Auramine, N-2,4,5-trichlorophenyl leuco Auramine, **Rhodamine-B**-anilinolactam, Thodamine-(p-nitroanilino)lactam, **Rhodamine-B**-(p-chloroanilino)lactam, 3-dimethylamino-6-methoxyfluoran,

3-diethylamino-7-methoxyfluoran, 3-diethylamino-7-chloro-6-methylfluoroan, 3-diethylamino-6-methyl-7-anilino-fluoran, 3-diethylamino-7-(acetylmethylamino)fluoran, 3-diethylamino-7-(dibenzylamino)fluoran, 3-diethylamino-7-(methylbenzylamino)fluoran, 3-diethylamino-7-(chloroethylmethylamino)fluoran, 3-diethylamino-7-(diethylamino)fluoran, 3-methyl-spiro-dinaphthopyran, 3,3'-dichloro-spiro-dinaphthopyran, 3-benzyl-spiro-dinaphthopyran, 3-methyl-naphtho-(3-methoxybenzo)-spiropyran, 3-propyl-spirodibenzoidipyran, etc. Mixtures of these color precursors. . . .

IT 15625-89-5, Trimethylolpropane triacrylate 41556-26-7, Tinuvin 292
60506-81-2, Dipentaerythritol pentaacrylate
 (photocopying materials with photohardening microcapsules contg. color precursors, hydrogels and)

L12 ANSWER 3 OF 4 USPATFULL

PI US 4877697 19891031

AB A liquid crystal display having display filter elements in registration with display electrodes. The filters are produced using color proofing films which are imaged to produce a regular pattern of dots. Filter elements are illuminated by electrodes selection to produce changeable images.

DETD . . . Gr (C.I. 21100), Permanent Yellow DHG (product of Hoechst AG), Brilliant Carmine 6B (C.I. 15850), Rhodamine 6G Lake (C.I. 45160), **Rhodamine B** Lake (C.I. 45170), Phthalocyanine Blue non-crystal (C.I. 74160), phthalocyanine Green (C.I. 74260), Carbon Black, Fat Yellow 5G, Fat Yellow 3G, . . .

IT 97-90-5 109-17-1 1070-70-8 2358-84-1 3290-92-4 4986-89-4
 12542-30-2 13048-33-4 15625-89-5 26570-48-9 31621-69-9
 42978-66-5 52277-33-5 **60506-81-2** 120177-92-6 125871-02-5
 (photosensitive layers contg., for manuf. of color filter arrays for liq.-crystal display devices)

L12 ANSWER 4 OF 4 USPATFULL

PI US 4073968 19780214

AB A method of desensitization of a color developer to form a color upon reaction with a color former which comprises coating a photocurable composition containing a photocurable compound on a color developer sheet and then irradiating the coated surface with light to cure the photocurable compound and thereby desensitize the color developer surface.

SUMM . . . 3,3-bis(1,2-dimethylindol-3-yl)-6-dimethylaminophthalide, 3,3-bis(9-ethylcarbazol-3-yl)-5-dimethylaminophthalide, 3,3-bis(2-phenylindol-3-yl)-5-dimethylaminophthalide, and 3-p-dimethylaminophenyl-3-(1-methylpyrrol-2-yl)-6-dimethylaminophthalide; diphenylmethane-type compounds such as 4,4'-bis-dimethylaminobenzohydrin benzyl ether, N-halophenyl-leucoauramines, or N-2,4,5-trichlorophenyl leucoauramine; xanthene-type compounds such as **rhodamine B**-anilinolactam,

rhodamine B p-nitroanilinolactam, **rhodamine**

B p-chloroanilinolactam, 3-dimethylamino-7-methoxyfluorane, 3-diethylamino-7-methoxyfluorane, 3-diethylamino-6-methoxyfluorane, 3-diethylamino-7-chlorofluorane, 3-diethylamino-7-chloro-6-methylfluorane, 3-diethylamino-6,8-dimethylfluorane, 3-diethylamino-7-acetylmethylaminofluorane, 3-diethylamino-7-methylaminofluorane, 3,7-diethylaminofluorane, 3-diethylamino-7-dibenzylaminofluorane, 3-diethylamino-7-methylbenzylaminofluorane, 3-diethylamino-7-phenylamino-3-methylfluorane, 3-diethylamino-7-chloroethylmethylaminofluorane, and 3-diethylamino-7-dichloroethylaminofluorane; thiazine-type compounds such as. . .

IT 75-56-9D, reaction products with xylylene diamine 78-24-0D, esters with

acrylic acid and linseed oil fatty acids 79-10-7D, esters with tripentaerythritol esters with linseed oil fatty acids 85-46-1 90-94-8 106-91-2D, reaction product with toluene diisocyanate and tung oil fatty acids 119-61-9, uses and miscellaneous 471-34-1, uses and

miscellaneous 1314-13-2, uses and miscellaneous 3524-62-7
6028-57-5
7727-43-7 9016-45-9 13463-67-7, uses and miscellaneous 14807-96-6
15625-89-5D, reaction products with ketone resonance 26471-62-5D,
reaction products with glycidylmethacrylate and tung oil fatty acids
26603-36-1D, reaction products with propylene oxide 26635-92-7
33007-83-9 37294-40-9D, reaction product with trimethylolpropane
triacrylate **60506-81-2** 65111-34-4D, reaction products with
ketone resins 65111-35-5 65256-54-4
(printing inks contg., photohardenable, for desensitization of
pressure-sensitive copying paper color developer sheets)

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(FILE 'HOME' ENTERED AT 16:24:54 ON 12 OCT 2000)

FILE 'REGISTRY' ENTERED AT 16:25:01 ON 12 OCT 2000

L1 66 S DIPENTAERYTHRITOL PENTAACRYLATE
L2 1 S DIPENTAERYTHRITOL PENTAACRYLATE/CN
L3 343 S 1 VINYL 2 PYRROLIDINONE
L4 0 S 1 VINYL 2 PYRROLIDINONE/CN
L5 1 S 88-12-0
L6 0 S N PHENYL GLYCINE/CN
L7 89 S N PHENYL GLYCINE
L8 1 S 103-01-5
L9 1 S CAMPHORQUINONE/CN

FILE 'CA' ENTERED AT 16:27:45 ON 12 OCT 2000

L10 1 S L2 AND L5 AND L8 AND L9

FILE 'USPATFULL' ENTERED AT 16:29:12 ON 12 OCT 2000

L11 0 S L10
L12 4 S L2 AND (RHODAMINE B OR BODIPY RED)

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DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE	TOTAL
	ENTRY	SESSION
CA SUBSCRIBER PRICE	0.00	-0.53

STN INTERNATIONAL LOGOFF AT 16:34:59 ON 12 OCT 2000

L10 ANSWER 1 OF 1 CA COPYRIGHT 2000 ACS

AN 122:20290 CA

TI Development of photopolymer-liquid crystal composite materials for dynamic

hologram applications

AU Sutherland, Richard L.; Natarajan, Lalgudi V.; Tondiglia, Vincent P.; Bunning, Timothy J.; Adams, W. Wade

CS Science Applications International Corporation, Dayton, OH, 45431, USA
SO Proc. SPIE-Int. Soc. Opt. Eng. (1994), 2152 (DIFFRACTIVE AND HOLOGRAPHIC OPTICS TECHNOLOGY), 303-13

CODEN: PSISDG; ISSN: 0277-786X

DT Journal

LA English

CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

AB Switchable holog. gratings are desirable for a wide range of applications in diffractive optics. Liq. cryst. materials look attractive for these devices because of their large field-induced birefringence. The combination of electrooptical liq. crystals with photopolymeric holog. materials offers a unique single system approach to the economical fabrication of switchable holograms. We report on the progress in our development of a novel system where holog. gratings are recorded in a single step process and consist of periodic polymer-dispersed liq.

crystal

planes. Gratings have been recorded with high diffraction efficiency (approaching 100%) and narrow angular selectivity (<1.degree. FWHM). The diffraction efficiency can be controlled elec. or thermally.

ST photopolymerizing liq crystal composite dynamic holog; polymer dispersed liq crystal holog recording

IT Holography

(diffraction gratings, dynamic; photopolymg. compn. for dynamic holog. recording contg. acrylate monomers and liq. crystal E7 and initiators)

IT Diffraction gratings

(holog., dynamic; photopolymg. compn. for dynamic holog. recording contg. acrylate monomers and liq. crystal E7 and initiators)

IT 61-73-4, Methylene Blue 88-12-0, uses 103-01-5,

N-Phenylglycine 124-07-2, Octanoic acid, uses 465-29-2,

Camphorquinone 11121-48-5, Rose Bengal 60506-81-2,

Dipentaerythritolhydroxy pentaacrylate 63748-28-7, E7

RL: TEM (Technical or engineered material use); USES (Uses)

(photopolymg. compn. for dynamic holog. recording contg. acrylate monomers and liq. crystal E7 and initiators)

L26 ANSWER 14 OF 41 CAPLUS COPYRIGHT 2001 ACS
 AN 1996:12817 CAPLUS
 DN 124:118944
 TI **Fluorescence** probes for monitoring polymerization processes
 AU Wang, Z. Jeffrey; Song, J. C.; Bao, Rong; Neckers, D. C.
 CS Cent. Photochem. Sci., Bowling Green State Univ., Bowling Green, OH,
 43403, USA
 SO J. Polym. Sci., Part B: Polym. Phys. (1996), 34(2), 325-33
 CODEN: JPBPEM; ISSN: 0887-6266
 DT Journal
 LA English
 CC 37-6 (Plastics Manufacture and Processing)
 Section cross-reference(s): 38, 42
 AB Several intramol. charge transfer **fluorescence** probes, such as
 the dansyl amides (1a-d), 4-dimethylamino-4'-nitrobiphenyl (2) and
 4-(dicyanomethylene)-2-methyl-6-(p-dimethylaminostyryl)-4H-pyran (3),
 have been developed and evaluated. The **fluorescence** emission of the
 probes is sensitive to both the solvent polarity and medium
 microviscosity. A spectral blue shift, attributed to an increase in
 microviscosity, was obsd. as polymn. proceeded. Therefore, these
fluorescence probes can be used for monitoring polymn. processes.
 The correlation between the **fluorescence** emission intensity
 ratio and degree of cure is linear in various formulations, which may be
 cured either **photochem.** and thermally. The selectivity and
 sensitivity of the **fluorescence** probes have been investigated.
 4-Dimethylamino-4'-nitrobiphenyl (2) was found to be the most sensitive
 probe to both solvent polarity and medium microviscosity.
 ST **fluorescence** probe monitoring polymn; crosslinking coating
fluorescence probe
 IT Coating materials
Fluorescence
 Solvent effect
 (fluorescence probes for monitoring polymn. processes)
 IT Tiles
 (floor, **fluorescence** probes for monitoring polymn. processes)
 IT Crosslinking
 (photochem., **fluorescence** probes for monitoring
 polymn. processes)
 IT **Photographic** films
 (transparency, **fluorescence** probes for monitoring polymn.
 processes)
 IT 15625-89-5, Saret 351 25322-68-3D, Polyethylene glycol, diarylates
 60506-81-2, Sartomer 399
 RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC
 (Process)
 (fluorescence probes for monitoring polymn. processes)
 IT 2143-87-5, 4-Dimethylamino-4'-nitrobiphenyl 34532-47-3 43040-78-4
 51325-91-8 51908-46-4 96100-93-5, 5-(Dimethylamino)(N,N-
 dibutyl)naphthalenesulfonamide
 RL: PRP (Properties); TEM (Technical or engineered material use); USES
 (Uses)
 (p

L26 ANSWER 5 OF 41 CAPLUS COPYRIGHT 2001 ACS
 AN 1998:545649 CAPLUS
 DN 129:223049
 TI Three-dimensional artificial lattice device and its manufacture using
 interference pattern of laser beam
 IN Esawa, Takeshi; Taketomi, Yoshitaka
 PA Matsushita Electric Industrial Co., Ltd., Japan
 SO Jpn. Kokai Tokkyo Koho, 21 pp.
 CODEN: JKXXAF
 DT Patent
 LA Japanese
 IC ICM G02B005-18
 ICS G02B005-30; C08F290-06
 CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related
 Properties)
 Section cross-reference(s): 38

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10221515	A2	19980821	JP 1997-24911	19970207
AB	The device has plural pattern structures with different n (refractive index), and contains a region which shows dependency of light scattering property on the polarized plane and is included in one of the pattern structures. The device emits sp. polarized component of incident light to				
	sp. direction. The device is manufd. by applying a photosensitive material consisting of monomers, a substance absorbing sp.-wavelength light, and an optically-anisotropic substance on a transparent substrate and irradiating the material with laser light which is split into 2 beams forming an interference pattern on the material. The material includes a multifunctional polyester acrylate, a bifunctional acrylate, a liq. crystal, and a polymn. initiator. an (di, meth)acrylate monomer and/or dimethacrylate monomer. The polarization anisotropy of the photosensitive material is given by (i) addn. of (di and/or meth)acrylate monomer, (ii) a thin-film coating on the substrate, and/or (iii) UV irradsn. prior to the lattice formation.				
ST	artificial lattice diffraction pattern resin photopolymn ; grating diffraction manuf interference pattern exposure; acrylic polyester diffraction grating manuf photopolymn ; ITO precoated glass substrate optical lattice; UV irradsn photosensitive compn diffraction grating				
IT	Nematic liquid crystals (BL; manuf. of polymer-based 3-dimensional diffraction grating using interference pattern of split laser beam)				
IT	Borosilicate glasses RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses) (Pyrex, substrates; manuf. of polymer-based 3-dimensional diffraction grating using interference pattern of split laser beam)				
IT	Polyesters, uses RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses) (acrylic; manuf. of polymer-based 3-dimensional diffraction grating using interference pattern of split laser beam)				
IT	Glass, uses RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses) (alkali-free, substrates; manuf. of polymer-based 3-dimensional				

diffraction grating using interference pattern of split laser beam)

IT Diffraction gratings
 UV radiation
 (manuf. of polymer-based 3-dimensional diffraction grating using
 interference pattern of split laser beam)

IT Semiconductor materials
 (oxide-based, substrate coatings; manuf. of polymer-based
 3-dimensional
 diffraction grating using interference pattern of split laser beam)

IT 212491-36-6P 212491-47-9P 212491-56-0P 212491-63-9P 212491-70-8P
 212491-77-5P
 RL: DEV (Device component use); IMF (Industrial manufacture); PREP
 (Preparation); USES (Uses)
 (manuf. of polymer-based 3-dimensional diffraction grating using
 interference pattern of split laser beam)

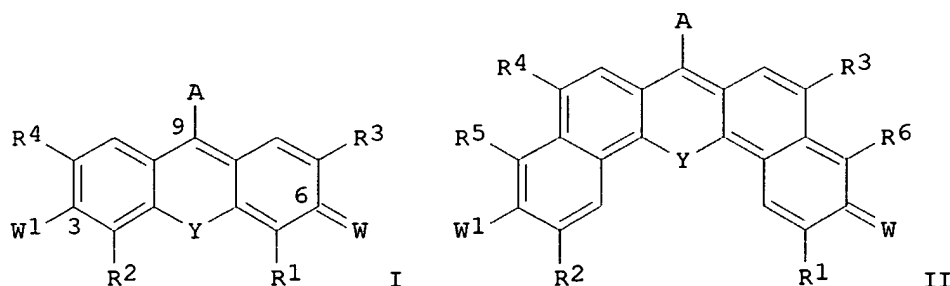
IT 2321-07-5, **Fluorescein**
 RL: DEV (Device component use); MOA (Modifier or additive use); USES
 (Uses)
 (manuf. of polymer-based 3-dimensional diffraction grating using
 interference pattern of split laser beam)

IT **103-01-5**
 RL: DEV (Device component use); MOA (Modifier or additive use); USES
 (Uses)
 (polymn. initiators; manuf. of polymer-based 3-dimensional diffraction
 grating using interference pattern of split laser beam)

IT 50926-11-9P, Indium tin oxide
 RL: DEV (Device component use); IMF (Industrial manufacture); PREP
 (Preparation); USES (Uses)
 (substrate coatings; manuf. of polymer-based 3-dimensional diffraction
 g

L26 ANSWER 15 OF 41 CAPLUS COPYRIGHT 2001 ACS
 AN 1995:947058 CAPLUS
 DN 124:147143
 TI Fluorone and pyronin Y derivatives
 IN Neckers, Douglas C.; Shi, Jianmin
 PA Spectra Group Limited, Inc., USA
 SO U.S., 18 pp. Cont.-in-part of U.S. Ser. No. 881, 048, abandoned.
 CODEN: USXXAM
 DT Patent
 LA English
 IC ICM F21V009-00
 ICS G03C001-725
 NCL 252582000
 CC 35-3 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 41, 74
 FAN.CNT 5

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5451343	A	19950919	US 1993-154880	19931119
	WO 9514689	A1	19950601	WO 1994-US695	19940118
	W: CA, JP				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	US 5623080	A	19970422	US 1995-388802	19950215
PRAI	US 1991-702886		19910520		
	US 1991-756611		19910909		
	US 1991-772103		19911007		
	US 1992-881048		19920511		
	US 1993-154880		19931119		
OS	MARPAT 124:147143				
GI					



AB Compds. I and II absorb light at >350 nm and are useful as **fluorescers** or **photoinitiators**, where W is O, W1 is H or -OR9, W is =NR+2, W1 is H or NR2+2, A is H, alkenyl, alkyl, or an electron withdrawing group, and the remaining groups are as defined in the disclosure. Thus, a compn. contg. 90 g trimethylolpropane triacrylate, 10 g N-vinylpyrrolidone, 3.6 mg 3-hydroxy-2,4,5,7-tetraiodo-6-fluorone, and 75 mg N-phenylglycine was cured with light.

ST fluorone dye **photopolymn** catalyst; trimethylolpropane triacrylate vinylpyrrolidone **photopolym**

IT Electron donors

RL: CAT (Catalyst use); USES (Uses)

(coinitiators; fluorone and pyronin derivs. as **photoinitiators** for manuf. of)

IT Urethane polymers, reactions
 RL: RCT (Reactant)
 (diacrylate, polymers with polyacrylates; fluorone and pyronin derivs. as **photoinitiators** for manuf. of)

IT Dyes
 (fluorone and pyronin derivs. as **photoinitiators** for manuf. of)

IT Onium compounds
 RL: CAT (Catalyst use); USES (Uses)
 (fluorone and pyronin derivs. as **photoinitiators** for manuf. of)

IT Polymerization catalysts
 (photochem., fluorone and pyronin derivs. as **photoinitiators** for manuf. of)

IT 25067-24-7P 42978-66-5DP, Tripropylene glycol diacrylate, polymers with polyacrylates 42978-66-5P, Tripropylene glycol diacrylate
 57636-10-9P,
 Polyethylene glycol diacrylate polymer **60506-81-2DP**, polymers with polyacrylates 86469-75-2P 105759-55-5P 155662-14-9P 173364-46-0P
 RL: IMF (Industrial manufacture); PREP (Preparation)
 (fluorone and pyronin derivs. as **photoinitiators** for manuf. of)

IT 142189-37-5P, 3-Hydroxy-2,4,5,7-tetrabromo-6-fluorone 142189-38-6P, 3-Hydroxy-2,4,5,7-tetraiodo-6-fluorone 142189-40-0P, 5,7-Diiodo-3-methoxy-6-fluorone 144735-93-3P,
 9-Cyano-3-hydroxy-2,4,5,7-tetrabromo-6-fluorone 144735-94-4P,
 9-Cyano-3-hydroxy-2,4,5,7-tetraiodo-6-fluorone 145603-64-1P, 2,7-Di-tert-butyl-3-hydroxy-6-fluorone 145603-65-2P, 2,7-Di-tert-butyl-4,5-diiodo-3-hydroxy-6-fluorone 145603-68-5P, 4,5-Diiodo-3-hydroxy-6-fluorone 145603-69-6P, 9-Cyano-3-hydroxy-6-fluorone 145603-70-9P, 9-Cyano-2,4,5,7-tetra-tert-butyl-3-hydroxy-6-fluorone 145603-71-0P,
 9-Cyano-4,5-diiodo-3-hydroxy-6-fluorone 145603-73-2P,
 9-Cyano-2,7-di-tert-butyl-4,5-diiodo-3-hydroxy-6-fluorone 152833-86-8P, 5,7-Diiodo-3-ethoxy-6-fluorone 161728-47-8P, 5,7-Diiodo-3-butoxy-6-fluorone 164660-83-7P 164660-90-6P 164660-91-7P, 9-Cyano-3-hydroxy-4,5,7-triiodo-2-octyl-6-fluorone 170846-31-8P 170846-32-9P, 9-Cyano-5,7-diiodo-3-methoxy-6-fluorone 170846-33-0P, 9-Cyano-5,7-diiodo-3-ethoxy-6-fluorone 170846-34-1P 170846-35-2P, 3-Hydroxy-2,4,5,7-tetrachloro-6-fluorone 170846-36-3P, 3-Hydroxy-2,4,5,7-tetrafluoro-6-fluorone 170846-37-4P, 9-Cyano-3-hydroxy-2,4,5,7-tetrachloro-6-fluorone 170846-38-5P, 9-Cyano-3-hydroxy-2,4,5,7-tetrafluoro-6-fluorone 170846-39-6P, 9-Cyano-3-hydroxy-4,5,7-triiodo-2-octanoyl-6-fluorone 170846-40-9P, 3-Hydroxy-4,5,7-triiodo-2-octanoyl-6-fluorone 170846-41-0P, 3-Hydroxy-2,4,5,7-tetraiodo-6-thiafluorone 170846-43-2P, 9-Cyano-3-hydroxy-4,5,7-triiodo-2-pentanoyl-6-fluorone 170846-44-3P, 3-Hydroxy-4,5,7-triiodo-2-pentyl-6-fluorone 170846-45-4P, 9-Cyano-3-hydroxy-4,5,7-triiodo-2-pentyl-6-fluorone 170846-46-5P, 7-Benzoyl-2,4,5-triiodo-3-hydroxy-6-fluorone 173364-44-8P
 173364-45-9P
 RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
 (fluorone and pyronin derivs. for **fluorescers** and **photoinitiators**)

IT 69169-99-9P, 3,6-Dihydroxy-4,5-diiodoxanthone
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation)
 (manuf. and reaction of)

IT 102914-73-8P, 3,6-Dihydroxyxanthane
 RL: IMF (Industrial manufacture); PREP (Preparation)

(manuf. and reaction with iodic acid)
IT 1214-24-0P, 3,6-Dihydroxyxanthone
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation)
(manuf. and redn. of)
IT 164660-82-6P, 3-Butoxy-6-hydroxy xanthane
RL: IMF (Industrial manufacture); PREP (Preparation)
(manuf. from butoxyhydroxyxanthone)
IT 60025-94-7P, 3-Hydroxy-6-fluorone
RL: IMF (Industrial manufacture); PREP (Preparation)
(manuf. from dihydroxyxanthone)
IT 164660-81-5P, 3-Butoxy-6-hydroxyxanthone
RL: IMF (Industrial manufacture); PREP (Preparation)
(manuf. from dihydroxyxanthone)
IT 39731-28-7P, 6-Hydroxy-3-methoxyxanthone 170846-61-4P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation)
(manuf. from dihydroxyxanthone)
IT 142189-39-7P, 6-Hydroxy-3-methoxyxanthane
RL: IMF (Industrial manufacture); PREP (Preparation)
(manuf. from hydroxymethoxyxanthone)
IT 170846-62-5P
RL: IMF (Industrial manufacture); PREP (Preparation)
(manuf. from octoxyhydroxyxanthone)
IT 145603-66-3P 164660-85-9P, 2-Octanoyl-3,6-dihydroxy xanthane
164660-88-2P, 2-Octyl-3,6-dimethoxyxanthane 164660-89-3P,
3,6-Dihydroxy-2-octylxanthane
RL: IMF (Industrial manufacture); PREP (Preparation)
(manuf. of)
IT 15007-07-5P, 3,6-Dimethoxy xanthone 141247-89-4P, 3,6-Dimethoxy
xanthane
145603-67-4P 164660-84-8P, 2-Octanoyl-3,6-dimethoxy xanthane
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation)
(manuf. of)
IT 131-55-5, 2,2',4,4'-Tetrahydroxybenzophenone
RL: RCT (Reactant)
(manuf. of dihydroxyxanthone from)
IT 103-01-5, N-Phenylglycine 2909-77-5 52754-92-4,
Diphenyliodonium hexafluoroantimonate 121239-75-6, (4-
Octyloxyphenyl)phenyliodonium hexafluoroantimonate
RL: CAT (Catalyst use); USES (Uses)
(photopolymer. catalysts contg. fluorones and)
IT 2217-78-9DP, Diphenyliodonium hydroxide, complexes with
hydroxytetraiodofluorone 142189-38-6DP, 3-Hydroxy-2,4,5,7-tetraiodo-6-
fluorone, complexes with diphenyliodonium hydroxide
RL: CAT (Catalyst use); IMF (Industrial manufacture); PREP (Preparation);
USES (Uses)
(photopolymer. catalysts contg. fluorones and)
IT 7664-93-9, Sulfuric acid, reactions
RL: RCT (Reactant)
(reaction with dihydroxyxanthane and methylpropanol)
IT 75-65-0, reactions
RL: RCT (Reactant)
(reaction with dihydroxyxanthane and sulfuric acid)
IT 77-78-1, Dimethyl sulfate 109-65-9, Butyl bromide 111-83-1, Octyl
bromide
RL: RCT (Reactant)
(reaction with dihydroxyxanthone)
IT 111-64-8, Octanoyl chloride
RL: RCT (Reactant)
(reaction with dimethoxyxanthane)
IT 7782-68-5, Iodic acid
RL: RCT (Reactant)
(reaction with octanoyldihydroxyxanthane)
IT 151-50-8, Potassium cyanide
RL: RCT (Reactant)

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AN 122:20290 CA

TI Development of photopolymer-liquid crystal composite materials for dynamic

hologram applications

AU Sutherland, Richard L.; Natarajan, Lalgudi V.; Tondiglia, Vincent P.; Bunning, Timothy J.; Adams, W. Wade

CS Science Applications International Corporation, Dayton, OH, 45431, USA
SO Proc. SPIE-Int. Soc. Opt. Eng. (1994), 2152 (DIFFRACTIVE AND HOLOGRAPHIC OPTICS TECHNOLOGY), 303-13
CODEN: PSISDG; ISSN: 0277-786X

DT Journal

LA English

CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

AB Switchable holog. gratings are desirable for a wide range of applications in diffractive optics. Liq. cryst. materials look attractive for these devices because of their large field-induced birefringence. The combination of electrooptical liq. crystals with photopolymeric holog. materials offers a unique single system approach to the economical fabrication of switchable holograms. We report on the progress in our development of a novel system where holog. gratings are recorded in a single step process and consist of periodic polymer-dispersed liq.

crystal

planes. Gratings have been recorded with high diffraction efficiency (approaching 100%) and narrow angular selectivity (<1.degree. FWHM). The diffraction efficiency can be controlled elec. or thermally.

ST photopolymerizing liq crystal composite dynamic holog; polymer dispersed liq crystal holog recording

IT Holography

(diffraction gratings, dynamic; photopolymg. compn. for dynamic holog. recording contg. acrylate monomers and liq. crystal E7 and initiators)

IT Diffraction gratings

(holog., dynamic; photopolymg. compn. for dynamic holog. recording contg. acrylate monomers and liq. crystal E7 and initiators)

IT 61-73-4, Methylene Blue 88-12-0, uses 103-01-5,
N-Phenylglycine 124-07-2, Octanoic acid, uses 465-29-2,
Camphorquinone 11121-48-5, Rose Bengal 60506-81-2,
Dipentaerythritolhydroxy pentaacrylate 63748-28-7, E7

RL: TEM (Technical or engineered material use); USES (Uses)

(photopolymg. compn. for dynamic holog. recording contg. acrylate monomers and liq. crystal E7 and initiators)

L26 ANSWER 3 OF 41 CAPLUS COPYRIGHT 2001 ACS
 AN 2000:299445 CAPLUS
 DN 133:81488
 TI Three-dimensional optical data storage in a **fluorescent dye-doped photopolymer**
 AU Wang, Mark M.; Esener, Sadik C.
 CS Department of Electrical and Computer Engineering, University of California at San Diego, La Jolla, CA, 92093, USA
 SO Appl. Opt. (2000), 39(11), 1826-1834
 CODEN: APOPAI; ISSN: 0003-6935
 PB Optical Society of America
 DT Journal
 LA English
 CC 74-12 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
 AB The authors propose a new monolithic multilayer optical storage medium in which data may be stored through the diffusional redistribution of **fluorescent** mols. within a polymer host. The active portion of the medium consists of a **photopolymer** doped with a **fluorescent** dye that is polymd. at the focal point of a high-numerical-aperture lens. As the **fluorescent** mols. bond to the polymer matrix they become more highly concd. in the polymd. regions, resulting in the modulated data pattern. Since data readout is based on detection of **fluorescence** rather than index modulation as in other **photopolymer**-based memories, the problems of media shrinkage and optical scatter are of less concern. An intensity threshold obsd. in the recording response of this material due to the presence of inhibitor mols. in the **photopolymer** allows for the 3-D confinement of recorded bits and therefore multilayer recording. The nonlinear recording characteristics of this material were studied through a simple model of **photopolymn.** and diffusion and verified exptl. Both single-layer and multilayer recordings were demonstrated.
 ST optical storage dye doped **photopolymer**
 IT Information systems
 (optical storage; three-dimensional optical data storage in a **fluorescent dye-doped photopolymer**)
 IT Polymerization
 (**photopolymn.**; three-dimensional optical data storage in a **fluorescent dye-doped photopolymer**)
 IT Fluorescence
 Fluorescent dyes
 Optical memory devices
 Optical recording
 Simulation and Modeling, physicochemical
 (three-dimensional optical data storage in a **fluorescent dye-doped photopolymer**)
 IT Polymers, uses
 RL: NUU (Nonbiological use, unclassified); TEM (Technical or engineered material use); USES (Uses)
 (three-dimensional optical data storage in a **fluorescent dye-doped photopolymer**)
 IT 10373-78-1, Camphor quinone
 RL: MOA (Modifier or additive use); NUU (Nonbiological use, unclassified);
 USES (Uses)
 (**photosensitizer**; three-dimensional optical data storage in a **fluorescent dye-doped photopolymer**)
 IT 105759-55-5, Dipentaerythritol pentaacrylate-1-vinyl-2-pyrrolidinone

copolymer

RL: NUU (Nonbiological use, unclassified); TEM (Technical or engineered material use); USES (Uses)

(three-dimensional optical data storage in a **fluorescent dye-doped photopolymer**)

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RE

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